PATHFINDER

An informal newsletter published for the GPS user community by PM GPS. Information presented is based on published and submitted news items of interest to the general user. Widest dissemination and reproduction is encouraged. Newsworthy items are solicited for inclusion. Editor Mr. Don Mulligan at PM GPS, PM NAV SYS, Ft Monmouth NJ DSN 992-6137 or (732) 532-6137 or email: Donald.Mulligan@iews.monmouth.army.mil

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PLGR, The Legacy System Soldiers On.

PM's Corner

Hello GPS Users!

It's only natural, everyone wants the "Latest and Greatest" equipment. For GPS, that means the brand-new compact DAGR GPS receiver.

Headquarters Army recently approved the official DAGR fielding plan and we are gearing up to produce and field DAGR across the Army over the next few years.

Even though we are expediting DAGR, the legacy PLGR will remain the primary military-rated GPS receiver in the Army for several years to come. We are committed to maintaining effective support for PLGR!

Check out the information about next-generation rechargeable batteries that applies to PLGR today and DAGR tomorrow. And while it may not have all the 'bells and whistles' of the latest commercial receiver, PLGR remains your only source of SECURE GPS. Remember, a commercial GPS set that is jammed, spoofed or can't handle a hostile environment could malfunction when you need it most.

When reliability and accuracy counts, make PLGR, with active crypto-variable key to access the PPS signal, your trusted source of GPS positioning data.

Skip Harborth, LTC, SC

Product Manager, GPS

Ramping Up DAGR NET!

Bill Hardy, Senior GPS Instructor is hard at work with the GPS NET Team developing the NET course to introduce DAGR beginning this Fall. NET teams will travel world-wide in support of DAGR fielding to help units establish DAGR training programs.

Shown in front of Bill are some of the common issue DAGR accessories: Clockwise from top: The DAGR, pocket guide and TM, carrying case, vehicular mount, remote antenna with cable and external power cable.

Photo—PM GPS

Remember:
PPS is not just GPS, Its SECURE GPS!

Are You Operating Current Version PLGR Software?

Standard PLGR (tan) - Use 613-9854-005
Enhanced PLGR (green) - Use 613-9868-008

Modification Work Order (MWO) 11-5825-291-30-4
USAF TCTO 31R-2PSN11-507 (Feb 2003)

Q: Why do we need new software?

A: To correct an internal software filter reset deficiency that may cause intermittent position and timing errors.

Q: Why are there two versions of PLGR software?

A: The computer chips in enhanced PLGR have greater memory capacity than those in standard PLGR. Such hardware differences require two versions of PLGR software. Even so, all PLGR are considered interchangeable for most applications. One difference between standard and enhanced PLGR has to do with laser range finders. See the article on page 3 for more information.

Q: How do we get this new software in our PLGR?

A: It's a "do it yourself" process at the unit or Direct Support Unit. You need hardware and software components:

Check to see if you have PLGR Reprogramming Kits that were distributed in 1997 or 1999. The 2003 kit is described in the current MWO but it was not "free-issued" like earlier kits. If you don't have kits, try borrowing the current kit from your MWO Coordinator or CECOM LAR.

1997 Kit # 6130K3116758ANS

1999 Kit # 5825K3118004ANS

2003 Kit # 5825K3118012ANS

All kits contained the same two hardware components:

- Reprogramming cable, NSN 6150-01-382-1551
- Regulated Power Supply, NSN 6130-01-396-4211

The kits also have the same software for the host PC but the format varies, 3.5" floppy disk versus CD. The difference between kits is the "Load Files" disk or CD containing the corrective software issued each year.

For the current upgrade, get the 2003 CD with "PLGR Reset Anomaly Update" software (part # LKN-P97).

Q: We looked. We don't have the kits. Now what?

A: If you can't borrow the current kit from an MWO Coordinator or CECOM LAR, you can requisition the hardware items using the NSN listed above. You can download the software from the CECOM software center at http://www.sed.monmouth.army.mil/

Above: Reprogramming components include a PC or laptop computer with software disc, regulated power supply and reprogramming cable. SAFETY NOTE: Always remove the main power battery from PLGR prior to applying external power! Below: Serial data port and external power connections on PLGR. Photos Bill Pohlmann.

Note: The MWO/TCTO uses incorrect nomenclature for the "regulated power supply" calling it the "AC power adapter". These are 2 different items. The MWO/ TCTO lists the correct power supply NSN.

If you can't borrow a kit locally and requisitioning is a problem, you can establish a Loan Agreement with PM GPS to borrow PLGR Reprogramming Kit(s) for a specified period of time. Contact the Loan Manager, Darlene Phillips, at DSN 992-8406 or Darlene.Phillips@iews.monmouth.army.mil.

The Compliance Period for completing PLGR software updates is 30 days after receipt of TCTC/MWO & kit.

Frank Rowe, Georgia Field Office DSN 468-9511 or Bill Pohlmann, Fort Monmouth DSN 992-6131.

More Information about PLGR Software and Laser Range Finders!

The previous article noted that hardware differences mean standard PLGR cannot host software version **613-9868-008** (also referred to as PLGR+96 software). That version contains a targeting module that allows PLGR to work seamlessly with certain models of laser range finders. Which brings us to the question:

Q: Aren't all laser range finders the same?

A: No, the use of laser range finder (LRF) equipment has expanded greatly in recent years and various commands use LRF technology from various manufacturers. There is no Product Manager responsible for LRF equipment so there is no "standard product". Each command selects LRF products from the marketplace to improve targeting capabilities . We caution all LRF users to be aware of how your system works when connected to PLGR: Some use the targeting module to determine target coordinates and others use the PLGR Way Point feature.

The largest percentage of hand held LRF used in the DoD community come from two manufacturers: Leica, maker of the Vector IV and Vector 21, and Northrop Grumman, maker of the Mark VII.

The Leica LRF is designed to use the targeting module in the PLGR+96 software (613-9868-008) and therefore can only be used with the enhanced PLGR (green).

The Mark VII is designed to use the existing PLGR Way Point Message format in order to display target information. Since it doesn't use the targeting module in PLGR+96 software, the Mark VII works with either standard PLGR (tan) or enhanced PLGR (green).

As the use of LRF expands, we will maintain current advice on the GPS website. CAUTION: Fatalities have occurred as a result of mistakes or the incorrect use of LRF. ***User Awareness*** of how the product operates is absolutely critical to the mission and to life-safety.

William Burnette, Georgia Field Office DSN 468-1109 and Bill Pohlmann, Fort Monmouth, DSN 992-6131.

PS: Read the article on PLGR and Laser Accuracy in the Sep-Oct 2002 issue of Field Artillery Magazine by SFC Steven Hekeler. Look up that issue at: http://sill-www.army.mil/FAMAG/

The GPS "Home Team" Takes Care of The Good, Bad and Ugly PLGR!

PM GPS Monmouth Field Office staff, Darlene Phillips and Bill Pohlmann hold two badly damaged PLGR recovered from the supply system. Photo PM GPS

Recovering assets that end up in the wrong depot is part of the PM GPS commitment to support PLGR which remains a controlled stock item: Damaged PLGR should be returned to the Rockwell Depot; Excess PLGR should be cross-leveled within command supply; If PLGR are still excess, contact PM GPS for disposition guidance. Even so, some PLGR end up in government depots from which they must be retrieved and forwarded to the Rockwell Depot. Some PLGR will be tagged for de-militarization and scrap but most can be refurbished and placed in the Rockwell Depot pool to replace PLGR coming in from field units.

Although some PLGR are damaged beyond repair, the owning unit did the right thing by returning them to a depot even if it wasn't the right one! All non-operational PLGR regardless of damage must be returned to the Rockwell Depot, the only facility authorized to remove the security chip and to legally scrap PLGR. Disposal of PLGR through DRMO is never authorized.

Suzanne Reinhardt-Smith , DSN 992-5758

Questions about Reprogramming PLGR Software?

Software: Frank Rowe at DSN 468-9511

Reprogramming: Bill Pohlmann at DSN 992-6131.

Loan of PM GPS Reprogramming Kits (Loan Agreement Required): Darlene Phillips at DSN 992-8406

Next Generation Battery Charger: The Soldier Portable PP-8498/U

The new Army charger, the Soldier Portable Charger, NSN 6130-01-495-2839, (shown at right) is now available! The PP-8498/U is a state of the art charging system that combines the features of a multi-station and the prior battery charger, the PP-8444. It also incorporates enhanced features to allow faster charging and built in trouble-shooting to better manage your battery stocks.

It charges two batteries at a time and automatically sequences to the next set to be charged. The rig automatically revisits the batteries to top off the charges for maximum performance while the batteries remain in the charger. It will be capable of charging the new Army family of rechargeable batteries through the use of adapter plates and can be updated with new software to accommodate any new "ARMY approved" batteries introduced in the future! The PP-8498/U is available from stock for $1,893.00 and comes with a 4 year warranty.

Is it worth the purchase price for your unit? Do the math: For most garrison or training missions, you can probably use rechargeable batteries. Take stock of the cost of the different types of throw-away batteries that you could replace with rechargeable batteries and the PP-8498/U. You may find the new generation of rechargeables works for you and saves money! The only drawback today is the lack of an adapter plate for AA cells. (see article on page 5).

The Soldier Portable Charger, PP-8498/U with 4 sets of adapters. Second from left are two BB-2800 for PLGR.

Don Brockel at CECOM Power Sources, DSN 992-4948.

New Rechargeable Batteries Offer Cost Savings for Handheld GPS

Traditionally we think of rechargable batteries as only being practical in training environments. But based on the improved performance of two new products, you may want to reconsider that point of view!

First, Lithium-Ion technology!

The US Army Power Source Center of Excellence (PSCOE) at CECOM has developed a new rechargeable battery for the PLGR using state-of-the-art lithium-ion technology. The new BB-2800, NSN: 6140-01-490-5372, is identical in size to the BA-5800 and it lasts about 18 hours in normal usage. It also features a built-in State-of-Charge meter with a five LED segment display! It is now available in the supply system.

We suggest 2 batteries for each PLGR in your inventory. Two batteries can be recharged in the Soldier Portable Charger, PP-8498/U, described above using the appropriate adapter, SPC-2800, NSN: 5940-01-493-6750. With four adapters you can sequence up to eight batteries for charging. Your unit can get a lot of mileage out of this charger since it can also service a variety of other batteries including the new BB-2590 (NSN: 6140-01-490-4316), SINCGARS rechargeable battery.

The previously fielded charger, the PP-8444A/U can also be used, but it will only handle one adapter with two batteries for unattended recharging.

Second, Nickel Metal Hydride technology!

New AA size Nickel Metal Hydride (NiMH) batteries are another viable rechargeable battery option. Eight fully-charged NiMH AA batteries in the PLGR battery adapter should last over 10 hours in normal use.

Since the new charger doesn't currently offer an AA adapter, you'll want to use cheap commercial fast chargers to charge your AA batteries (see article top page 5).

When DAGR units become available, they can also use AA NiMH batteries.

We recommend a review of unit battery consumption: If the mission supports the use of these new longer-lasting rechargeable batteries, get them! Set up an SOP to organize rotation through the chargers and discover how cost effective rechargeable batteries can be.

Bill Pohlmann, Ft Monmouth, DSN 992-6131

Rechargeable Solutions for AA Cells Today

Okay, you've read about the Soldier Portable Charger to service the family of unique Army batteries. What about the common AA battery that is used as an alternative for PLGR and will be a primary battery for DAGR tomorrow?

CECOM is considering adding an adapter plate to allow you to "plug in" and recharge 4 AA cells in one of the slots on the new PP-8498/U charger but a decision to proceed with this adapter has not been made. So,

"Go Commercial!" There is a wide variety of affordable commercial AA charging stands available today at discount and electronics stores.

For example, you can get a charging stand to service 4 AA cells complete with AC wall adapter and a 12V car adapter for as little as $30. Or go "high tech" with a solar powered charging stand for between $100- $300!

The rate of charging and # of AA cells serviced and other features will vary by price and you have a lot of options to choose from. Visit your favorite store or do an internet search using the words "AA cell, rechargeable battery and charger".

Don Brockel, CECOM Power Sources DSN 992-4948

Notice Advisory to NAVSTAR Users (NANU)

Q: What is a NANU message?

A: The Notice Advisory to NAVSTAR Users (NANU) message along with the GPS Status Message provides notice of planned or unscheduled changes in the status of the GPS satellite constellation. Messages are generated at Schreiber AFB, see example below.

Q: Should I be concerned about them?

A: The average ground user does not need to monitor NANU or GPS Status Messages since the Control Segment uses the almanac to provide GPS receivers with information about satellite health.

Q: Can I get NANU and Status Messages anyway?

A: Yes, if you want, you can obtain them via email by subscribing to the Navigation Center NANU List Server and/or the GPS Status Message List Server. Both sites are accessible at the US Coast Guard Navigation Center site at http://www.navcenter.uscg.gov.

Messages are generally released within 60 minutes of notification by the Air Force of a change to the GPS Constellation.

NOTICE ADVISORY TO NAVSTAR USERS (NANU) 2004071
SUBJ: SVN29 (PRN29) FORECAST OUTAGE JDAY 169/1200- JDAY 170/0000

1. NANU NUMBER: 2004071
NANU DTG: 11459Z JUN 2004
NANU Type: FCSTMX
REFERENCE NANU: N/A
REF NANU DTG: N/A
SVN: 29
PRN: 29
START JDAY: 169
START TIME ZULU: 1200
START CALENDER DATE: Thursday, June 17, 2004
STOP JDAY: 170
STOP TIME ZULU: 0000
STOP CALENDER DATE: Friday, June 18, 2004

2. CONDITION: GPS SATELLITE SVN29 (PRN29) WILL BE UNUSABLE ON JDAY 169 (17 JUN 2004) BEGINNING 1200 ZULU UNTIL JDAY 170 (18 JUN 2004) ENDING 0000 ZULU.

3. POC: CIVILIAN - NAVCEN AT 703-313-5900, HTTP://WWW.NAVCEN.USCG.GOV MILITARY - GPS Support Center at HTTP://WWW.SCHRIEVER.AF.MIL/GPSSUPPORTCENTER, DSN 560-2541, COMM 719-567-2493, GPS@SCHRIEVER.AF.MIL, HTTP://WWW.SCHRIEVER.AF.MIL/GPS MILITARY ALTERNATE - 14 AF AIR & SPACE OPERATIONS CENTER, DSN 276-9994, COMM 805-606-9994, V3SPACEAF.AOC@VANDENBERG.AF.MIL

GPS Satellites: Can't See Them, Can't Live Without Them!

Today, at least 24 GPS satellites on are station "24-7". This provides the level of service needed to sustain world-wide GPS coverage. There are also a number of spares that can be placed as needed when a 'primary' bird fails.

The satellites orbit the earth every 12 hours, emitting continuous navigation signals on two L-band frequencies. Signal accuracy allows the user to figure time to within a millionth of a second, velocity to within a fraction of a mile per hour and location to within meters.

There have been 3 generations of GPS satellites and a 4th is on the way. Eleven Block I satellites were launched starting in 1978. They were used to test GPS principles. Lessons learned from this first generation of satellites were incorporated into later designs.

The first Block II satellite was launched in 1989. Block II and the successor IIA satellites were launched through the 1990s to provide the world-wide constellation that made GPS famous. With the launches of 1993 the GPS constellation reached a milestone event called Initial Operational Capability (IOC). Since then a full complement of satellites has been maintained without a break. The Block II/IIA satellites had a projected service life of 7.5 years although some of the "birds" greatly outlasted that timeframe. A satellite's service life is a factor of the wear and tear of being in space and the consumption of the finite amount of onboard rocket fuel that is used to fine-tune the satellite position.

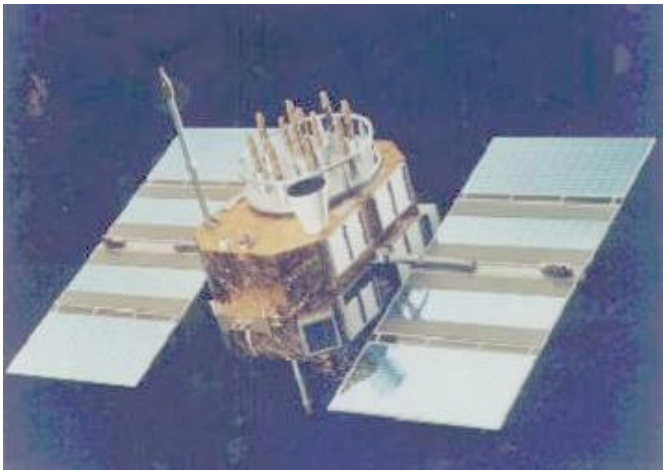
The third generation of satellites is the Block IIR. The first IIR bird was launched in 1997 and periodic launches continue today. The IIR replace the II/IIA as they reach the end of their service lives. IIR improvements include the ability to be reprogrammed in-flight which allows the satellite to fix problems that could otherwise render it prematurely unserviceable. The new design also features increased "hardness" and less dependence on ground contacts to maintain their position.

The next-generation of GPS satellite, the Block IIF will bring further advances including a big boost in signal strength and an extended service life. The Block IIF will also introduce new and more sophisticated GPS performance and security capabilities, not all of which can be discussed in this forum.

More satellite information than you wanted to know?

That's okay, the bottom line for GPS users is this:

The Space Segment at the GPS Joint Program Office in Los Angeles AFB is responsible for the design and acquisition of GPs satellites while the 2nd Space Operations Squadron at Schriever AFB in Colorado is responsible for GPS satellite operations. Together, these organizations provide uninterrupted GPS service for users worldwide. And through the evolution of technology, a new generation of GPS satellites will come on-line to preserve and extend the advantage of using the encrypted military GPS signal. Military GPS is not just GPS, its SECURE GPS!



A GPS satellite is about the size of a minivan (not including the large solar panels)

ATTENTION PLEASE!

PM GPS and the folks at PS Magazine work together to provide useful information about the operation and maintenance of GPS equipment.

In the July 2004 PS Magazine, Issue # 620 a gremlin snuck past us and as a result we would like to point out two corrections:

1. The GPS article recommended you discard the PLGR Soldiers Guide because it was outdated. What we meant to say we that we recommend you get the new edition dated August 2003 with updated information.

2. The correct NSN for an "eight-pack" of BA-5800 batteries is 6135-01-440-7774. The NSN listed in the article is the obsolete NSN for a single battery. The correct NSN is also listed on page 9-12 of the PLGR TM 11-5825-291-13 and TO 31R4-2PSN11-1, dated 1 April 2001.

Visit PS Magazine at: https://www.logsa.army.mil/

Then click on Publications and Forms to reach PS Magazine.

GRITS from Georgia Field Office, (Not Hominy Grits!)

The Breakfast of Champions (Southern Style) includes a bowl of grits with butter!

The Ground Receiver Integration Team (GRIT) was formed from attendees of the GPS Ground Receiver Integration Conference held in 2002. The GRIT is a subset of the GPS Army Integrated Product Team (IPT), consisting of managers, system engineers, integrating contractors, logisticians and others interested in technical details of GPS ground receiver integration.

Okay, not everyone knows what hominy grits means. Colonists first used the word "hominy" to mean processed corn. Corn kernels were coarsely ground and the fine flour was sifted out. Water or milk was added to the remainder and boiled until it formed a gritty pudding. Yum. That's pretty much the way it still is today. In some parts of the country, especially the South, grits is an essential part of breakfast.

PM GPS held its 4th GRIT meeting on 25-26 May 2004 at the ARINC Engineering Services facility in San Diego CA. This was the first meeting held since the award of the DAGR and GB-GRAM contracts. A representative from Rockwell Collins, the DAGR and GB-GRAM vendor presented product status updates and held a Question and Answer session. Government personnel provided programmatic updates, technical briefings and other presentations on PLGR, DAGR, and GB-GRAM.

Meeting minutes and briefings can be found on the website at: http://army-gps.robins.af.mil/GRIT.

A user name and pass word is required in order to gain access to GRIT information at the website. If you represent a Project or Product Manager, system engineer, integrating contractor, logistician or are otherwise interested in the details of GPS ground receiver integration, please contact us at the Georgia Field Office as listed below for a user name and pass word.

William Burnette, Jr. DSN 468-1109
Commercial (478) 926-1109 or email:
William.burnette@robins.af.mil

Or Frank Rowe at DSN 468-9511
Frank.rowe@robins.af.mil

How To Contact PM GPS

Product Management Office (PMO) Los Angeles CA

LTC Harborth, PM
Mr. David Williamson, DPM
(310) 363-6676 DSN: 833-6676
david.williamson@losangeles.af.mil

Monmouth Field Office (MFO) Ft Monmouth NJ

Mr. Allen Hart, Chief (732) 532-3523 DSN: 992-3523
allen.hart@iews.monmouth.army.mil or
Suzanne Reinhardt-Smith, (732) 532-5758 DSN 992-5758
Suzanne.reinhardt-smith@iews.monmouth.army.mil

Georgia Field Office (GFO) Warner Robins GA

Mr. Johnny Walker, Chief (478) 926-3288 DSN: 468-3288
johnny.walker@robins.af.mil or
Mr. William Burnette (478) 926-1109, DSN 468-1109

Who to Call?

For GPS integration and new products, call the PMO.

For equipment authorizations, maintenance status, fielding, host vehicle installations and New Equipment Training, call the MFO.

For sustainment support including software, supply, technical publications and accessories, call the GFO.

If you need further assistance, contact the editor at donald.mulligan@iews.monmouth.army.mil or one of the Help Lines listed on the back cover!

Visit the PM GPS WEBSITE at: http://Army-gps.robins.af.mil

What to Do With a Damaged PLGR? There is Only One Answer:

One of the three PLGR shown at right is damaged beyond repair. Whether your PLGR was run over by a vehicle, took a bullet for you or just stopped operating, the same solution applies to all PLGR all the time: If it mal-functions or ceases to operate or "appears" to have sustained damage, turn it in through your support structure or directly to the Rockwell Depot if you operate independently. The repair return procedures are in the PLGR TM and they can be found at the PM GPS website at http://army-gps.robins.af.mil or contact the Monmouth or Georgia Field offices listed in this newsletter. See the related article on page 3.

Got good PLGR but excess to requirement? The Army has a home for every PLGR ever built! If you have excess, contact Installation Property or PM GPS. Never send a PLGR to DRMO disposal!

NEED GPS HELP? Call one of our Help-lines:

Willie Jackson at the Georgia Field Office, DSN 468-3518 Willie.Jackson@robins.af.mil
Jim Buggy at the Monmouth Field Office, DSN 992-4733 James.Buggy@iews.monmouth.army.mil.

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